



One step closer to the final product, design development is just as it sounds: further development of the schematic designs. By now, project designs should be fully developed except for the details of how the pieces fit together. Loose schematic sketches are tightened up to clarify how all spaces work and, more definitely, how materials and systems will work room by room. This tightening is important from a cost control perspective because it prevents the project from advancing too far without letting you know what total cost impact your decisions are having on the big picture.

At the completion of design development you should know how each space within your facility responds to your anticipated use of that space. Take the time, at this point, to have your architect and construction manager (if on-board) explain the building to you.

During previous steps, you and your team should have been establishing criteria and making global assumptions about solutions. Design development is the time when specific decisions should be made.

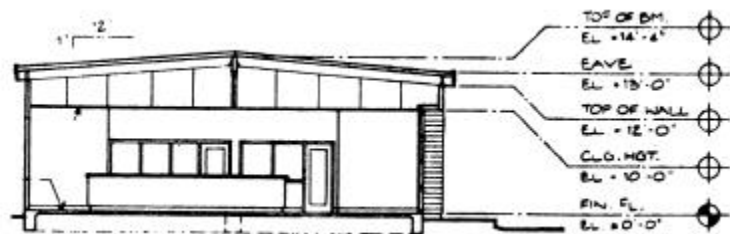
If you are concerned about cost, be aware of the false assumption that the "best" solution is always the most expensive. When a Chevrolet will cost less up-front and over time, why choose a Rolls Royce which costs more up-front and over time both in interest and maintenance?

Finalization Of Floor Plans, Elevations, Sections

Delineation of the project during design development should finalize floor plans, elevations and sections throughout the building. Typical wall construction should be identified.

From a perspective, there is little difference between completed design development drawings and completed construction drawings. The design development plans indicate major dimensions and are drawn to scale for other smaller spaces. They show locations of structural elements and mechanical chases, those spaces that allow access to the systems. The completed construction drawings will display all dimensions and reference all details, finishes, doors and other information necessary to construct the project.

Completed design development drawings cover elevations of the building with wall heights, materials and locations and types of windows indicated. The building sections indicate how the interior parts of the building work in the vertical dimension, including delineation of how mechanical and electrical systems interface with structural elements and ceilings. More detailed sections show all of the components within each of the typical walls being used.



BUILDING SECTION

It is important for you to "walk through" each room, to see if it works operationally. Note the locations of doors and of any glazing for visibility into adjacent spaces. After this stage, the reconfiguration of rooms and walls will have a substantial impact on the A/E and consultants as each of the separate disciplines will be working out details so they all fit together. Last-minute changes oftentimes detract from proper coordination of the drawings. These changes translate to change orders during construction which are never cheap.

Finalization Of Security Decisions

Similar to your review of each space for function, a security review helps you verify that the design meets your security needs. You should be familiar with the materials being used for the floor, walls and ceiling of each room.

You should know what kind of doors you're using for each room, what kind of window frames and glazing, what kind of light fixtures. Do you need a speaker in every room; if so, should each be two-way?

Have communication needs been met? Does it all work together as a well orchestrated and integrated security and communications system?

Finalization Of Finishes

Once again, go through each room to see if you have carpeting where you want it and simple concrete where it will do the job. The same applies to walls and ceilings - should they be ceramic tile, bare concrete or painted?

Finalization Of Plumbing, Mechanical And Electrical Systems

Oftentimes these building systems are ignored and left to the engineers because of their more technical nature. Because these items represent approximately one-third of the first cost of your facility and have the potential to strongly influence lifecycle costs, the job is only two-thirds complete if you and your architect do not understand the implications of the engineers' assumptions. At this point, the engineers have determined the needs for each space and developed a means of meeting these needs. For heating and air conditioning the mechanical engineer should know the size(s) of the heating and cooling equipment. (Air conditioning is measured in tons, heating in BTUs per hour.) Engineers base their designs on known information for each room, such as:

How many people will use each space (people give off heat).

What kinds of light fixtures or other heat-generating equipment will be in each room.

How much exterior wall, window and roof area is included.

The architect is responsible for making sure each engineering discipline has and is using all of the needed information. Ask your architect how the mechanical system was sized. Express your expectation that it was done in an accurate manner oftentimes engineers use "rule of thumb" design for sizing their systems. As with any rule of thumb design method, a conservative assumption is used to be "safe." This approach saves the engineer money in design time, but often you pay for a system that was oversized just to be safe. Your first and future operating costs can go up.

The same applies to electrical, lighting, and communications design. Your consultant should base lighting design on known needs for each room. "Rule of thumb" selection and spacing of lighting fixtures will cost more to install and operate.

Ask what diversity factor is being used in design of electrical equipment. Diversity is a calculation in which the engineer assumes 100 percent or less of all outlets, lights, etc. will be used simultaneously. This is a conservative approach, whether or not it is realistic. It is more costly and some believe this added expense is really an insurance policy for the electrical designer rather than a realistic benefit to you.

The Budget

By now you've made a lot of decisions. They could affect the cost of your new facility by as much as 50 percent if you chose all of the most expensive solutions. Do your selections reflect previous assumptions? Were you aware, during the process, what decisions the design team was making for you? When making decisions, were you thinking of your previous assumptions and were your architects and construction managers informing you of the cost impact of your decisions?

Ideally each decision and its impact should have been tracked throughout the process. If not, verify the budget now by completing an estimate before proceeding. Figure out where you stand. Make necessary decisions now to keep on track through the remainder of your project.

DESIGN DEVELOPMENT

1. Do you understand each room of your facility in terms of function, security, finishes and mechanical/electrical design?

Yes**No****Not Sure**

2. Do you know the cost impact of decisions made during this process?

Yes**No****Not Sure**

3. Have you updated the cost control report?

Yes**No****Not Sure**

4. Have you checked your budget for each building system against the schematic design budget and resolved any variances with the parties responsible for each system?

Yes**No****Not Sure**

5. Have the variances among previous and current outline specifications been noted and the cost impact documented?

Yes**No****Not Sure**

6. If you told your design team to complete the drawings while you went on vacation, based on the decisions confirmed, do you think you'd be satisfied with the final product upon your return?

Yes**No****Not Sure**

7. Does it meet needs identified in the project statement and requirements identified in the program?

Yes**No****Not Sure**

8. Are designs and specifications being developed according to your bidding strategy?

Yes**No****Not Sure**